

D11 E-Motorcycle Controller



Brief Introduction:

Vehicle control technology is integrated into this series controller to provide efficient control of the three phase AC motor for the vehicle power drive system, providing the most cost-effective design for vehicle developers and providing a flexible, comfortable and safe handling experience for vehicle drivers and passengers.



Features:

- To gain higher power density and overload capacity, SMD MOSFET and aluminum plate cooling technology are adopted
- The power supply of control signal can be provided by power battery
- High-performance vector control algorithm to achieve full speed range of motor speed and precise torque control, improving vehicle power performance and comfort.
- Flexible parameter adjustment function meets the excellent handling in various environment
- Providing longer endurance mileage through braking and reverse energy feedback control
- Achieve quick mass commissioning against same type of vehicles through control panel or parameters copy or backup
- Thorough fault self-diagnosis, monitoring and protection functions to achieve high reliability of the system
- Multi-functional I/O terminals, meeting the requirements of different applications
- Natural cooling,
- Customized software available for meeting different requirements of customers
- CAN bus communication and software update by computer programming

Typical Application:

- Applicable to e-motorcycles powered by rated voltage of battery 48 VDC.

Safety Considerations:

 Warning
<ul style="list-style-type: none"> ● Do not touch control terminals, circuit boards and any other electronic parts and components of controller with bare hands!
<ul style="list-style-type: none"> ● Do not arbitrarily wring or remove the fixed screws, breathable valve and gasket of controller!
<ul style="list-style-type: none"> ● Wiring must strictly conform to this manual. Failure to comply may result in personnel injury and/or equipment damage!
<ul style="list-style-type: none"> ● Make sure the input power supply has been completely disconnected before wiring. Failure to comply may result in personnel injury and/or equipment damage!
<ul style="list-style-type: none"> ● Wiring screws and bolts for power input/output terminals must be screwed tightly. Failure to comply may result in equipment damage!
<ul style="list-style-type: none"> ● After applying the power, never touch the controller and peripheral circuits otherwise there will be electric shock hazard!
<ul style="list-style-type: none"> ● It is not allowed to start & stop the drive frequently via direct switching power on or off. Failure to comply may result in equipment damage!
<ul style="list-style-type: none"> ● Make sure the controller is in a non-output status before switch-on/switch-off of the controller input and/or contactor. Failure to comply may result in equipment damage!
<ul style="list-style-type: none"> ● Only qualified technicians are allowed to implement the maintenance, and troubleshooting.
<ul style="list-style-type: none"> ● Never implement the maintenance, and troubleshooting before power supply has been turned off and discharged completely. Failure to comply may result in electric shock hazard!
<ul style="list-style-type: none"> ● To avoid an electric shock hazard, wait at least 10 minutes after the power has been turned off and make sure the residual voltage of the bus capacitors has discharged to 0V before performing any work on the drive!
 Attention
<ul style="list-style-type: none"> ● Handle the equipment gently and take hold of its sole plate so as to avoid foot injury or equipment damage.
<ul style="list-style-type: none"> ● Prevent drilling residues, wire ends and screws from falling into the equipment during installation. Failure to comply may result in faults or equipment damage.
<ul style="list-style-type: none"> ● Never touch fan, heat sink with bare hands. Failure to comply may result in equipment damage and/or personal injury.
<ul style="list-style-type: none"> ● Do not touch the electric components with bare hands during maintenance, and troubleshooting. Failure to comply may result in component damage due to ESD.

- All pluggable components can be inserted or pulled out only when power has been turned off.

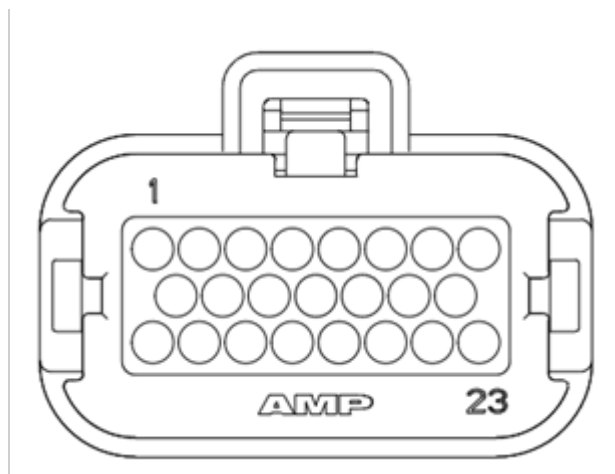
Key technical features:		
Electrical characteristics		
Controller Model	KTZ05H19ZMAXX	The last two code represent the software version
Auxiliary power voltage	9-16V DC	
Rated battery volt	48V DC	
Input Voltage	40V~70V	
Rated output current	80A	
output current	180Arms (60S)	
Rated output power	3kW	
Highest efficiency	≥98%	Rated condition
Output freq range	0.00~600Hz	
Mechanical characteristics		
Dimensions	180*99*60 L*W-Φ=164*60-4Φ6	Please read external dimension below for more details
Screw torque of protection cover	/	
Screw torque of power terminals	M5*(16~20), 2.8Nm-3.5Nm	B+, B-, U, V, W
Screw torque of bottom installation plate	M6, 4.8~7Nm	
Cooling method	Natural cooling (Air flow 3m/s is required for rated 80Arms 1 hour)	
Control characteristics		
Model No.	D11	
Control Mode	Vector control: speed control or torque control	
Encoder type	Magnetic encode (chip model: AS5047D or switching Hall sensor)	
Speed range	1:1000	
Speed accuracy	±0.02%	
Start torque	0Hz, 200%	
Torque response	<5ms	

Torque accuracy	±5%	
Basic performances		
Accel/Decel time	0.00~60000s	
Switching frequency	0.7~10kHz	
Frequency set mode	communication or analog input control	
Torque set mode	communication or analog input control	
Stop method	Freewheeling to stop, coast to stop	
Communication method	CAN bus communication	
Input terminals	Digital : 7 Analog : 1 Power supply : 1 channel	
Output terminals	none	
Motor Type	PMSM, IM or BLDC	
Motor temperature sensor	NTC、KTY84、PT1000	
Unique characteristics		
parameter adjustment and parameter copy/backup through control panel, PC monitoring software upgrade		
Motor parameters auto-turning, field-weakening control, energy feedback, and three groups of fault record.		
Overall protections		
over-voltage	75V	
Controller over-heat	85°C	
Motor over-heat	130°C	
The bearable lowest temperature of	-40°C	

controller		
Battery under-voltage	30V	
Controller overload		
Motor overload		
Short-circuit between output and aluminum plate		
Output phase loss		
Encoder disconnected		
Auto-tuning failed		
Speed bias is large		
Current detection abnormal		
Power supply is abnormal when running		
Environment		
Storage temperature	-40°C~+85°C, GB/T 18488.1	
Ambient temperature	-40°C~+55°C, GB/T 18488.1	
Altitude	2000m, De-rate 1% for every 100m when the altitude is above 1000 meters	
Relative humidity	5~95%, condensation allowed, GB/T 18488.1	
salt spray	GB/T 2423.17	
Vibration	Sweep vibration and random vibration, GB/T 18488.1	
IP grade	IP65	

Insulation strength	1500V, 1min, ≤10mA	
Insulation resistance	1000V , hot insulation resistance> 10MΩ	
Safe grounding	The resistance between controller conductive parts can be reached and the enclosure ground point is less than 0.1Ω	

Controller Signal Connector:



The connector and terminals models related to vehicle wiring harness: AMP 770520-1/770854-1; AMP 770680-1 (plastic housing)

Copper core of cable : 0.5~1.25mm², Outer diameter of insulating layer : 1.7~2.7mm

PIN	Signal Nme	Definition	Remark
1	TEMP+	Motor temperature	Motor temperature sensor +
2	GND	Magnetic encoder -	Magnetic encoder -

3	5V_EN	Magnetic encoder +	Magnetic encoder +
4	P	Park	Active low
5	5V	Throttle control power	
6	KSI	12V battery+ switch	12V
7	CANL	CANL	Low end of CAN
8	CANH	CANH	High end of CAN
9	PWM	Encoder PWM	Connect to PWM when encoder is AS5047D
10	CRUISE	CRUISE	Active High
11	reserved	reserved	reserved
12	ISD	Throttle control signal	0-5VDS
13	Side Stand	Side stand signal	Active High
14	LOW	Low speed gear	Active High
15	AI	Analog signal (Reserved)	
16	Z (W)	Encoder Z (W)	Connect to Z when encoder is AS5047D Connect to W when using hall sensor
17	A (U)	Encoder A (U)	Connect to A when encoder is AS5047D Connect to U when using hall sensor
18	B (V)	Encoder B (V)	Connect to B when encoder is AS5047D Connect to V when using hall sensor
19	GND	Throttle -	Throttle -
20	HIGH	High speed gear	12V Effective
21	REVERSE	Reverse	12V Effective
22	BRAKE	Brake	12V Effective
23	GND	12V-	

Note: Customer shall pay close attention to the items marked by *

Power input & output terminals:

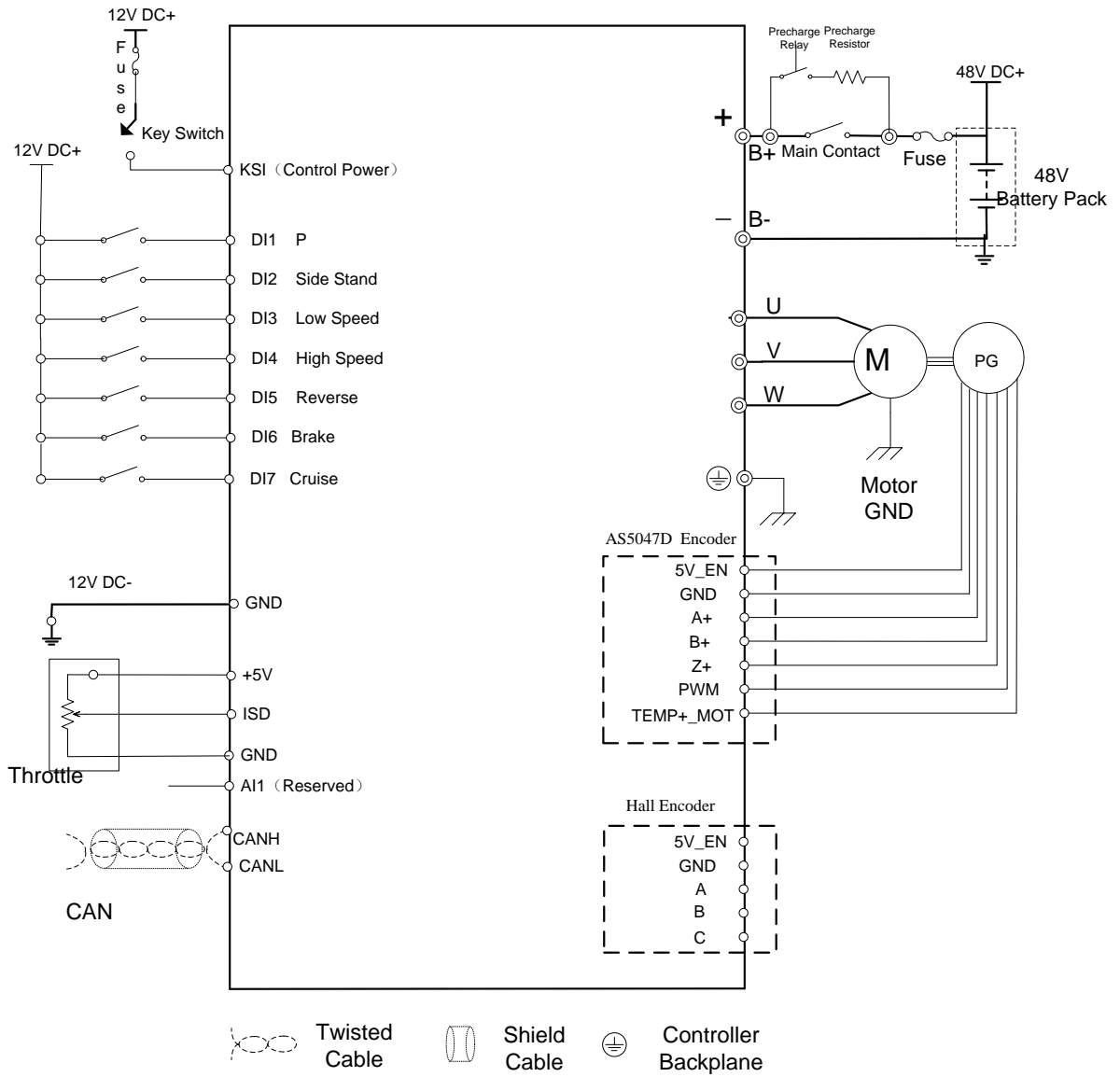
Terminal Name	Signal Definition	Copper core: mm ² , Metal terminal/Max size of cable insulation: mm	Rated voltage/current
B+	Battery input +	25, 7~9mm	300V DC/110Arms
B-	Battery input -	25, 7~9mm	300V DC/110Arms
U	Output U phase	35, 10~11mm	300V AC/150Arms
V	Output V phase	35, 10~11mm	300V AC/150Arms
W	Output W phase	35, 10~11mm	300V AC/150Arms

Commissioning tools:

CAN communication : USB-CAN adapter

Programming computer : Computer equipped with corresponding software

Typical electrical diagram



External Dimension:

